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PATENT APPLICATION
PO-7963
MD-02-111

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION OF)	
WILLIAM E. SLACK ET AL)	GROUP NO.: 1711
SERIAL NUMBER: 10/696,458)	
FILED: OCTOBER 29, 2003)	EXAMINER:
)	RABON A. SERGENT
TITLE: LIQUID PARTIALLY TRIMERIZED)	
AND ALLOPHANIZED POLYISO-)	
CYANATES BASED ON TOLUENE)	
DIISOCYANATE AND DIPHENYLMETHANE)	
DIISOCYANATE)	


LETTER

Mail Stop - Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 2231-1450

Sir:

Enclosed herewith is a copy of an Appeal Brief in the matter of the subject
Appeal. Please charge the fee for filing the Brief, \$500.00, to our Deposit Account
Number 13-3848 .

Respectfully submitted

By 
Lyndanne M. Whalen
Attorney for Appellants
Reg. No. 29,457

Bayer MaterialScience LLC
100 Bayer Road
Pittsburgh, PA 15205-9741
Phone: (412) 777-3024
FACSIMILE PHONE NUMBER:
(412) 777-3843
s:\shared\kgb\7963apbrltr

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Alexandria, VA 22313-1450 06/25/07

Date
Lyndanne M. Whalen, Reg. No. 29,457
Name of applicant, assignee or Registered Representative


Signature
June 25, 2007
Date



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TITLE: LIQUID PARTIALLY TRIMERIZED)	
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DIISOCYANATE AND DIPHENYL-)	
METHANE DIISOCYANATE)	

APPEAL BRIEF

Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450

Sir:

This Brief is an Appeal from the Final Action of the Examiner dated January 24, 2007 in which the rejections of Claims 1-5 were maintained.

I. **REAL PARTY IN INTEREST**

Each of the inventors has assigned his interest in the present application to Bayer Polymers LLC, the predecessor of Bayer MaterialScience LLC. Bayer MaterialScience LLC is therefore the real party in interest in this Appeal.

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01 FR-148d vndanne-McWhalen, Reg. No. 29,457
Name of applicant, assignee or Registered Representative


Signature
June 25, 2007
Date

II. RELATED APPEALS AND INTERFERENCES

There are no prior or pending appeals, interferences or judicial proceedings which are related to, affected by or have a bearing on the Board's decision in this Appeal.

III. STATUS OF CLAIMS

Claims 1-5 stand rejected and are the subject of this Appeal.

Claims 6-10 and 19 are allowed.

Claims 11-18 were cancelled in Appellants' Response filed October 31, 2006.

No Claims have been withdrawn from consideration.

No Claims have been objected to.

IV. STATUS OF AMENDMENTS

No amendments to the claims have been made or requested subsequent to the Final Action of the Examiner.

V. SUMMARY OF CLAIMED SUBJECT MATTER

The present invention is directed to storage-stable, liquid, partially trimerized and allophanized polyisocyanates (page 1, lines 1-2 of the specification) having an NCO content of from 15 to 41% by weight (page 6, lines 12-14 of the specification) composed of the partial trimerization and allophanation product (page 6, lines 16-17 of the specification) of (A) from 5-85% by weight TDI (page 6, line 18 of the specification); (B) from 5-85% by weight of a polyisocyanate of the diphenylmethane series (page 6, lines 26-27 of the specification); and (C) from 0.1 to 10% by weight of an organic compound or mixture thereof (page 12, lines 7-8 of the specification). The TDI has an isomer distribution of from 60 to 100% by weight of the 2,4- isomer (page 6, lines 19-20 of the specification) and from 0 to 40% by weight of the 2,6-isomer (page 6, line 22 of the specification) with the total of the 2,4- and 2,6-isomer contents being 100% by weight of component A (page 12, lines 21-

22 of the specification). The polyisocyanate of the diphenylmethane series (page 6, lines 26-27 of the specification) is composed of (i) from 0 to 50% by weight of polyisocyanates of the diphenylmethane series having an isocyanate functionality greater than 2 (page 12, lines 25-27 of the specification); (ii) from 40 to 100% by weight of 4,4'-diphenylmethane diisocyanate (page 12, lines 28-30 of the specification); (iii) from 0 to 20% by weight of 2,4'-diphenylmethane diisocyanate (page 13, lines 1-3 of the specification); and (iv) from 0 to 6% by weight of 2,2'-diphenylmethane diisocyanate (page 13, lines 5-7 of the specification) with the sum of the percentages totaling 100% by weight of component (B)(page 13, lines 7-8 of the specification). The organic compound or mixture thereof (page 12, lines 7-8 of the specification) contains from 1 to 4 hydroxyl groups capable of reacting with NCO groups (page 13, lines 9-11 of the specification) and has a molecular weight of from 32 to 6000 (page 13, line 11 of the specification). The sum of the percentages by weight of components (A), (B) and (C) total 100% by weight (page 12, lines 10-11 of the specification).

VI. GROUND'S OF REJECTION TO BE REVIEWED ON APPEAL

- A. Claims 1-5 stand rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over Claims 11-22 of U.S. Patent No. 6,515,125 (Slack et al) in view of Oertel (page 90).
- B. Claims 1-5 further stand rejected under 35 U.S.C. §102(a or e) as anticipated by Slack et al (U.S. Patent 6,515,125) in view of Oertel (page 90).
- C. Claims 1-5 also stand rejected under 35 U.S.C. §103(a) as obvious over Slack et al (U.S. Patent 6,515,125) in view of Oertel (page 90).

VII. ARGUMENTS

- A. Appellants' claimed invention is patentably distinct from the combined teachings of Claims 11-22 of Slack et al in view of Oertel.

Claims 11-22 of Slack et al are directed to a storage-stable, liquid prepolymer which is the reaction product of a partial trimerization product of TDI and MDI and NCO-reactive component.

Claims 11-22 of Slack et al do **not** teach or suggest a prepolymer formed from a partially trimerized **and allophanized** polyisocyanate.

Oertel teaches that allophanate groups are formed by reaction of a urethane group with isocyanates under "more energetic conditions" (e.g., temperatures of from about 120 to about 140°C or with a suitable catalyst at temperatures of about 100°C). Oertel also teaches that side reactions such as trimerization can be suppressed by addition of p-toluenesulfonic acid methyl ester. That is, Oertel teaches that trimerization of an allophanate is an undesirable reaction.

Slack et al sought and produced trimers which did not include modifications such as urethane, allophanate or carbodiimide groups. (See column 4, lines 28-32). It is these trimers which are used to produce the prepolymers claimed in Claims 11-22 of Slack et al.

Oertel teaches the production of allophanates.

Since Slack et al sought to avoid the presence of allophanate groups in the trimers from which the disclosed prepolymers were made, one skilled in the art reading Slack et al and Oertel at the time Appellants' made their invention would not consider it obvious to combine the teachings of Slack et al with Oertel or any other disclosure directed to allophanates.

Further, neither Claims 11-22 of Slack et al nor Oertel teaches a partial trimerization and allophanation product formed in the presence of a hydroxyl compound as required in Appellants' present invention.

Appellants' Claims 1-5 are therefore patentably distinct from the invention claimed by Slack et al in Claims 11-22 of U.S. Patent 6,515,125 in view of Oertel.

- B. Appellants' invention as claimed in Claims 1-5 is not anticipated by the combined teachings of Slack et al and Oertel.

Appellants' Claims 1-5 are directed to storage-stable, partially **trimerized and allophanized** polyisocyanates.

Slack et al does **not** disclose a partially trimerized and allophanized polyisocyanate satisfying the compositional requirements of Appellants' claims.

Appellants' claimed partially trimerized and allophanized product is formed in the presence of a hydroxyl group-containing compound. Slack et al forms the partial trimerization product disclosed therein **before** the hydroxyl group-containing compound is reacted with that trimerized product to produce the prepolymers disclosed therein.

Oertel does **not** disclose a partially trimerized and allophanized polyisocyanate.

The teachings of Slack et al and Oertel can not therefore be combined in any manner which would disclose Appellants' claimed liquid, storage-stable, partially **trimerized and allophanized** polyisocyanates to those skilled in the art..

The teachings of Slack et al and Oertel do not therefore anticipate Appellants' invention as claimed in Claims 1-5.

The Examiner has argued that Appellants have not established that the products claimed in the present invention are patentably distinct from the partial trimerization products disclosed by Slack et al.

Appellants submit that the teachings of the Slack et al reference support their position that the partially trimerized isocyanates disclosed in that reference do not include the allophanate groups which must be present in Appellants' claimed compositions.

More specifically, Slack et al teaches at column 4, lines 28-32:

The products made by the present invention can have a high % by weight of trimer (i.e., 20-65%) **without the need to include other modifications such as**, for example, urethane, **allophanate**, or carbodiimide, to prevent solids formation at 25°C. (emphasis added)

It is clear from this teaching that Slack et al sought and found a way to achieve a liquid trimer which did not include the allophanate groups known to cause formation of solids on storage.

The Examiner's argument is not therefore supported by the teachings of the Slack et al reference.

The Examiner has further argued that Appellants have not established that the product of Slack et al does not contain allophanate groups "when processed under the argued conditions". (Advisory Action, page 2, lines 7-8)

Appellants would direct the Board's attention to the fact that their claims directed to the process for producing their claimed storage-stable, liquid, partially trimerized and allophanized polyisocyanates (i.e., Claims 6-10 and 19) have been allowed by the Examiner over the Slack et al reference. Appellants submit that this allowance reflects a difference between the processing conditions taught by Slack et al and the processing conditions used to produce Appellants' claimed compositions.

It can not be properly assumed that different processes will produce the same product.

The Examiner's argument is not therefore supported by the facts in this case.

- C. Appellants' invention as claimed in Claims 1-5 is not rendered obvious by the combined teachings of Slack et al and Oertel.

Appellants' invention as claimed in Claims 1-5 must include **both** trimer and allophanate groups.

One skilled in the art reading the above-quoted teaching of Slack et al at column 4, lines 28-32 would not be motivated to include the

allophanate groups taught by Oertel in the Slack et al liquid trimer. In fact, that skilled artisan would need to ignore a key teaching of Slack et al if he were going to combine the teachings of Slack et al with those of Oertel in the manner suggested by the Examiner.

Appellants' claimed invention which requires the allophanate groups that Slack et al sought to avoid would not therefore have been obvious to one of ordinary skill in the art at the time Applicants made their invention by the teachings of Slack et al and Oertel. However, Oertel contains no teaching or suggestion that rebuts or negates the teachings of Slack et al with respect to inclusion of allophanate groups in the Slack et al trimers.

The teachings of Slack et al and Oertel can not therefore be properly combined in a manner which would render Appellants' claimed polyisocyanate containing both trimer and allophanate groups obvious to one of ordinary skill in the art at the time Appellants made their invention.

VIII. CONCLUSION

Neither Slack et al nor Oertel discloses a partially trimerized and allophanized polyisocyanate. The teachings of those references can not therefore be combined in any manner which would disclose Appellants' claimed partially trimerized and allophanized polyisocyanates to one skilled in the art. The teachings of Slack et al and Oertel do not therefore anticipate Appellants' claimed invention.

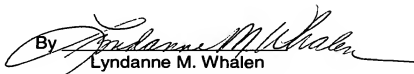
Slack et al sought, developed and disclose liquid trimers produced without use of modifying groups such as allophanate groups. Oertel contains no teaching which would suggest to one of ordinary skill in the art that the allophanate groups which Slack et al avoided could or should be included in Slack et al's trimers for any reason.

One skilled in the art reading the teachings of Slack et al and Oertel at the time Appellants' made their invention would not therefore be led by the teachings of those references to Appellants' claimed invention.

The combined teachings of Slack et al and Oertel do not therefore render Appellants' claimed compositions obvious.

Appellants therefore maintain that each of the Examiner's rejections is in error and respectfully request that each of these rejections be reversed and that the claims which are the subject of this Appeal (i.e., Claims 1-5) be allowed.

Respectfully submitted,

By 
Lyndanne M. Whalen
Attorney for Appellants
Reg. No. 29,457

Bayer MaterialScience LLC
100 Bayer Road
Pittsburgh, Pennsylvania 15205-9741
(412) 777-3843
FACSIMILE PHONE NUMBER:
(412) 777-3902
s:\shared\kgb\7963FapbrLMW

IX. CLAIMS APPENDIX

1. A storage-stable, liquid, partially trimerized and allophanized polyisocyanate having an NCO group content of 15 to 41% by weight, and comprising the partial trimerization and allophanation product of:

- (A) from 5 to 85% by weight of toluene diisocyanate having an isomer distribution of:
 - (1) from 60 to 100% by weight of the 2,4-isomer, and
 - (2) from 0 to 40% by weight of the 2,6-isomer, with the sum of the %'s by weight of (A)(1) and (A)(2) totaling 100% by weight of (A);

and

- (B) from 5 to 85% by weight of a polyisocyanate of the diphenylmethane series comprising:
 - (1) from 0 to 50% by weight of polyisocyanates of the diphenylmethane series having an isocyanate functionality greater than 2,
 - (2) from 40 to 100% by weight of 4,4'-diphenylmethane diisocyanate,
 - (3) from 0 to 20% by weight of 2,4'-diphenylmethane diisocyanate,and
 - (4) from 0 to 6% by weight of 2,2'-diphenylmethane diisocyanate,with the sum of the %'s by weight of (B)(1), (B)(2), (B)(3) and (B)(4) totaling 100% by weight of (B);

and

- (C) from 0.1 to 10% by weight of an organic compound or mixture thereof containing from 1 to 4 hydroxyl groups capable of reacting with NCO groups and having a molecular weight of from 32 to 6000

wherein the sum of the %'s by weight of (A), (B) and (C) total 100% by weight.

2. A storage-stable, liquid, partially trimerized and allophanized polyisocyanate according to Claim 1, wherein the storage-stable, liquid, partially trimerized polyisocyanate composition has an NCO group content of about 17 to about 39% by weight, and comprises:

- (A) from 10 to 80% by weight of toluene diisocyanate having an isomer distribution of:
- (1) from 60 to 100% by weight of the 2,4-isomer, and
 - (2) from 0 to 40% by weight of the 2,6-isomer, with the sum of the %'s by weight of (A)(1) and (A)(2) totaling 100% by weight of (A);

and

- (B) from 10 to 80% by weight of a polyisocyanate of the diphenylmethane series comprising:
- (1) from 0 to 50% by weight of polyisocyanates of the diphenylmethane series having an isocyanate functionality greater than 2,
 - (2) from 40 to 100% by weight of 4,4'-diphenylmethane diisocyanate,
 - (3) from 0 to 20% by weight of 2,4'-diphenylmethane diisocyanate,
- and
- (4) from 0 to 6% by weight of 2,2'-diphenylmethane diisocyanate,
- with the sum of the %'s by weight of (B)(1), (B)(2), (B)(3) and (B)(4) totaling 100% by weight of (B);

and

(C) from 0.1 to 10% by weight of an organic compound or mixture thereof containing from 1 to 4 hydroxyl groups capable of reacting with NCO groups and having a molecular weight of from 32 to 6000;

wherein the sum of the %'s by weight of (A), (B) and (C) total 100% by weight.

3. A storage-stable, liquid, partially trimerized and allophanized polyisocyanate according to Claim 1, wherein (C) is an aliphatic alcohol having from 1 to 36 carbon atoms or an aromatic alcohol having from 5 to 20 carbon atoms.

4. A storage-stable, liquid, partially trimerized and allophanized polyisocyanate according to Claim 3, wherein (C) is chosen from at least one of methanol, ethanol, 1,2-ethanediol, 1-propanol, 2-propanol, 1-butanol, isobutyl alcohol, 2-butanol, n-amyl alcohol, sec-amyl alcohol, tert-amyl alcohol, 1-ethyl-1-propanol, n-hexanol and isomers thereof, n-octyl alcohol, 2-octyl alcohol, 2-ethyl-1-hexanol, n-decyl alcohol, n-dodecyl alcohol, neopentylglycol, n-tetradecyl alcohol, n-hexadecyl alcohol, n-octadecyl alcohol, 1,2 and 1,3-propanediol, 1,4-butanediol, 1,3-butanediol, 2,3-butanediol, 3-methyl-2-butanol, 3,3-dimethyl-1-butanol, 2-ethyl-1,3-hexanediol, glycerol, 1,2,4-butanetriol, pentaerythritol, diethylene glycol, dipropylene glycol, diethylene glycol, triethylene glycol and phenol.

5. A storage-stable, liquid, partially trimerized and allophanized polyisocyanate according to Claim 4, wherein (C) is isobutyl alcohol.

X. EVIDENCE APPENDIX

None

XI. RELATED PROCEEDINGS APPENDIX

None